CLAIMS IN THE CASE

What is claimed is:

1. (Original) A method for clustering data in a virtual environment, comprising:

determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

generating a common data stream based on said at least one clustering parameter; and

sending said common data stream from a sending node to said cluster of receiving nodes.

2. (Original) The method of Claim 1, wherein said generating a common data stream further comprises:

generating a common video image stream as said common data stream of an object associated with said sending node using a new view synthesis technique, wherein said common video image stream is rendered from a common perspective in said virtual environment that is associated with said cluster of receiving nodes.

3. (Original) The method of Claim 2, wherein said common perspective is calculated from an average of said at least one clustering parameter.

4. (Original) The method of Claim 2, further comprising:

generating a three-dimensional model of said object to which said new view synthesis technique is applied to generate said common video image stream.

5. (Original) The method of Claim 1, wherein data streams associated with said cluster of receiving nodes are substantially similar.

6. (Original) The method of Claim 1, wherein said sending said common data stream further comprises:

multicasting said common data stream from said sending node over a communication network to said cluster of receiving nodes to achieve communication network traffic efficiency.

7. (Original) The method of Claim 1, wherein said at least one clustering parameter comprises a view dependent clustering parameter that defines an associated perspective of a receiving node within said virtual environment, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are similar resulting in said clustering parameter that is shared.

8. (Original) The method of Claim 1, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes require substantially the same frame rate, such that their respective data quality requirements are similar.

9. (Original) The method of Claim 1, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution parameter value, such that their respective data resolution requirements are similar.

10. (Original) The method of Claim 9, further comprising:
limiting resolution of said common data stream based on resolution capabilities of display devices associated with said cluster of receiving nodes.

11. (Original) The method of Claim 9, further comprising:
increasing a resolution parameter value of a receiving node as said sending node becomes more important to said receiving node in said virtual environment; and
decreasing said resolution parameter value as said sending node becomes less important to said receiving node in said virtual environment.

12. (Original) The method of Claim 11, further comprising:

valuing an importance of said sending node based on whether a receiving node is gazing at a representation of said sending node in said virtual environment.

13.   (Original) The method of Claim 11, further comprising:

valuing an importance of said sending node based on how close to a center of a monitoring device associated with said receiving node is a representation of said sending node displayed.

14.   (Original) The method of Claim 11, further comprising:

valuing an importance of said sending node based on whether said sending node is speaking.

15.   (Original) The method of Claim 1, wherein said determining a cluster of receiving nodes further comprises:

dynamically changing said test for determining said cluster of receiving nodes in said virtual environment in response to changing conditions for computational resources in a communication network supporting said virtual environment and said cluster of receiving nodes.

16.   (Original) A system for clustering data in a virtual environment, comprising:

a clustering module for determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

a data generator for generating a common data stream based on said at least one clustering parameter; and

a transmitter for sending said common data stream from a sending node to said cluster of receiving nodes.

17.   (Original) The system of Claim 16, wherein said at least one clustering parameter comprises a view dependent clustering parameter, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are substantially similar.

18. (Original) The system of Claim 16, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes require substantially the same frame rate, such that their data quality requirements are substantially similar.

19. (Original) The system of Claim 18, wherein said frame rate is increased as said cluster of receiving nodes is located closer to said sending node in said virtual environment.

20. (Original) The system of Claim 16, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution, such that their respective data quality requirements are substantially similar.

21. (Original) The system of Claim 20, wherein said resolution is dependent on a value of importance said sending node is to a receiving node, such that higher values of importance are associated with higher resolution.

22. (Original) The system of Claim 16, wherein said virtual environment comprises an N-way virtual collaborative environment.

23. (Original) A method for clustering data, comprising:

determining a cluster of receiving nodes among a plurality of receiving nodes, wherein a plurality of varying data streams are generated by a sending node for all of said plurality of receiving nodes depending on an associated value of a parameter for all of said plurality of receiving nodes, and wherein each of said cluster of receiving nodes have associated values for said parameter that as a set satisfies a test such that data streams associated with said cluster of receiving nodes are substantially similar;

generating a common data stream of a sending object associated with said sending node based on a representative value of said parameter; and

sending said common data stream to said cluster of receiving nodes.

24. (Original) The method of Claim 23, wherein each of said cluster of receiving nodes have associated values for a group of parameters that as said set satisfies said test such that data streams based on said group of parameters and associated with said cluster of receiving nodes are substantially similar.

25. (Original) A computer readable medium containing executable instructions which, when executed in a processing system, causes the system to perform the steps for clustering data in a virtual environment, comprising:

determining a cluster of receiving nodes in said virtual environment, wherein each of said cluster of receiving nodes have associated values for at least one clustering parameter that as a set satisfies a test;

generating a common data stream based on said at least one clustering parameter; and

sending said common data stream from a sending node to said cluster of receiving nodes.

26. (Original) The computer readable medium of Claim 25, wherein said generating a common data stream in said method further comprises:

generating a common video image stream as said common data stream of an object associated with said sending node using a new view synthesis technique, wherein said common video image stream is rendered from a common perspective in said virtual environment that is associated with said cluster of receiving nodes.

27. (Original) The computer readable medium of Claim 26, wherein said common perspective is calculated from an average of said at least one clustering parameter.

28. (Original) The computer readable medium of Claim 26, wherein said method further comprises:

generating a three-dimensional model of said object to which said new view synthesis technique is applied to generate said common video image stream. .

29. (Original) The computer readable medium of Claim 25, wherein data streams associated with said cluster of receiving nodes are substantially similar.

30. (Original) The computer readable medium of Claim 25, wherein said sending said common data stream in said method further comprises:
multicasting said common data stream from said sending node over a communication network to said cluster of receiving nodes to achieve communication network traffic efficiency.

31. (Original) The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a view dependent clustering parameter that defines an associated perspective of a receiving node within said virtual environment, wherein each of said cluster of receiving nodes is spatially located in said virtual environment, such that their respective perspectives are similar resulting in said clustering parameter that is shared.

32. (Original) The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a temporal clustering parameter, wherein each of said cluster of receiving nodes require substantially the same frame rate, such that their respective data quality requirements are similar.

33. (Original) The computer readable medium of Claim 25, wherein said at least one clustering parameter comprises a spatial clustering parameter, wherein each of said cluster of receiving nodes require substantially the same resolution, such that their respective data resolution requirements are similar.

34. (Original) The computer readable medium of Claim 33, wherein said method further comprises:
limiting resolution of said common data stream based on resolution capabilities of display devices associated with said cluster of receiving nodes.

35. (Original) The computer readable medium of Claim 33, wherein said method further comprises:

increasing a resolution parameter value of a receiving node as said sending node becomes more important to said receiving node in said virtual environment; and

decreasing said resolution parameter value as said sending node becomes less important to said receiving node in said virtual environment.

36.   (Original) The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on whether a receiving node is gazing at a representation of said sending node in said virtual environment.

37.   (Original) The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on how close to a center of a monitoring device associated with said receiving node is a representation of said sending node displayed.

38.   (Original) The computer readable medium of Claim 35, wherein said method further comprises:

valuing an importance of said sending node based on whether said sending node is speaking.

39.   (Original) The computer readable medium of Claim 25, wherein said determining a cluster of receiving nodes in said method further comprises:

dynamically changing said test for determining said cluster of receiving nodes in said virtual environment in response to changing conditions for computational resources in a communication network supporting said virtual environment and said cluster of receiving nodes.

40.   (Original) A computer system comprising:

a processor; and

a computer readable memory coupled to said processor and containing program instructions that, when executed, implements a method for clustering data, comprising:

determining a cluster of receiving nodes among a plurality of receiving nodes, wherein a plurality of varying data streams are generated by a sending node for all of said plurality of receiving nodes depending on an associated value of a parameter for all of said plurality of receiving nodes, and wherein each of said cluster of receiving nodes have associated values for said parameter that as a set satisfies a test such that data streams associated with said cluster of receiving nodes are substantially similar;

generating a common data stream of a sending object associated with said sending node based on a representative value of said parameter; and

sending said common data stream to said cluster of receiving nodes.